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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/051,554

01/17/2002

Malcolm J. Andrews

017575.0565 (TAMUS
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02/04/2003

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EXAMINER

ERDEM, FAZLI

ART UNIT

PAPER NUMBER

2826

DATE MAILED: 02/04/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/051,554

Applicant(s)

ANDREWS ET AL.

Examiner

Fazli Erdem

Art Unit

2826

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 December 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) _____ is/are rejected.
- 7) ☒ Claim(s) 9-12 and 18-21 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Allowable Subject Matter

1. Claims 9-12 and 18-21 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-4, 8, 13, 15, 16, 22 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Quate (4,575,822) in view of Nishino et al. (5,729,046) further in view of Miyahara et al. (4,764,898).

Regarding Claims 1-4, 8, 13, 15, 16, 22 and 24, Quate discloses method and means for data storage using tunnel current data readout where a digital memory in which data is stored by establishing perturbations in a surface of a substrate and identifying the perturbations by establishing a tunnel electron current between the surface of the substrate and a movable probe. The perturbations can be physical, electrical, or magnetic such that the tunneling electron current is affected thereby. Quate fails to disclose the pinning structure in detection and the pinning

structures in detail. However, Nishino et al. disclose superconducting device having pinning regions where the pinning structure is shown in detail. Furthermore, Miyahara et al. disclose a vortex memory device where the detection means are shown in detail.

It would have been obvious to one of having ordinary skill in the art at the time the invention was made to include the required pinning and the detection structures in Quate as taught by Nishino et al. and Miyahara et al. respectively in order to have a superconductor storage device with higher performance.

3. Claims 5 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Quate (4,575,822) in view of Nishino et al. (5,729,046) further in view of Miyahara et al. (4,764,898) further in view of Li et al. (6,188,920).

Regarding Claims 5 and 17, Quate, Nishino et al., and Miyahara et al. combinations disclose all the claimed subject matter except superconducting material of type Bi-Sr-Ca-Cu-O. However, Li et al. disclose a high performance $(\text{Bi,Pb})_2\text{-Sr}_2\text{-Ca}_2\text{-Cu}_3\text{-O}_Y$ composites where the required material type is shown.

It would have been obvious to one of having ordinary skill in the art at the time the invention was made to include the required material type in Quate, Nishino et al., and Miyahara et al. combination as taught by Li et al. in order to have a superconducting storage device with higher performance.

Art Unit: 2826

4. Claims 6, 7, 14, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Quate (4,575,822) in view of Nishino et al. (5,729,046) further in view of Miyahara et al. (4,764,898) further in view of Krusin-Elbaum et al. (5,912,21)

Regarding Claims 6,7,14, and 23, Quate, Nishino et al., and Miyahara et al. combinations disclose all the claimed subject matter except atom doping structure. However, Krusin-Elbaum et al. disclose enhancement of persistent currents in High TC superconductors where the atom doping structure is shown.

It would have been obvious to one of having ordinary skill in the art at the time the invention was made to include the required atom doping structure in Quate, Nishino et al., and Miyahara et al. combination as taught by Krusin-Elbaum et al. in order to have a superconducting storage device with higher performance.

5. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Quate (4,575,822) in view of Nishino et al. (5,729,046) further in view of Miyahara et al. (4,764,898) further in view of Gerber et al. (6,211,673).

Regarding Claim 25, Quate, Nishino et al., and Miyahara et al. combinations disclose all the claimed subject matter except the cantilever structure. However, Gerber et al. disclose an apparatus for use in magnetic-field detection and generation devices where the cantilever structure is shown.

It would have been obvious to one of having ordinary skill in the art at the time the invention was made to include the required cantilever structure in Quate, Nishino et al., and

Art Unit: 2826

Miyahara et al. combination as taught by Gerber et al. in order to have a superconducting storage device with higher performance.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fazli Erdem whose telephone number is (703) 305-3868. The examiner can normally be reached on M - F 8:00 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan Flynn can be reached on (703) 308-6601. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

FE
January 26, 2003

NATHAN J. FLYNN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800

A handwritten signature in black ink, appearing to be 'N. Flynn', written over the printed name and title.